MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2017/2018

TTP 3121 – TCP/IP PROGRAMMING

(All Sections / Groups)

5 JUNE 2018
2.30 p.m. – 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 4 printed pages including cover page with 5 questions only.

2. Attempt **ALL** questions. Marks and the distribution of marks for each question is given.

3. Please write all your answer in the Answer Booklet provided.

Question 1 [10 Marks]

(a) Draw a suitable sketch showing both TCP/IP stack and OSI Reference Model. Name **TWO** differences between their approaches to networking.

[4 Marks]

(b) Describe the purpose and operation of the Address Resolution Protocol (ARP).

[3 Marks]

(c) Briefly outline the features offered by Internet Control Message Protocol (ICMP).

[3 Marks]

Question 2 [10 Marks]

(a) Briefly explain **TWO** types of UNIX system calls and give **ONE** example for each type.

[5 Marks]

(b) Outline **TWO** usage of fork system call.

[2 Marks]

(c) What are the outputs of the following program? Assume that the parent process ID and child process ID are 13 and 14, respectively.

```
import os

print('Process (%s) start...' % os.getpid())
# Only works on Unix/Linux/Mac
pid = os.fork()
if pid == 0:
  print('I am child process (%s) and my parent is %s.' % (os
    .getpid(), os.getppid()))
else:
  print('I (%s) just created a child process (%s).' % (os
    .getpid(), pid))
```

[3 Marks]

Continued ...

Question 3 [10 Marks]

(a) Briefly illustrate how semaphore work.

[3 Marks]

(b) Examine the differences between FIFO and pipe.

[4 Marks]

(c) i. Determine the operation and function of the following program.
ii. Specify the outputs of the program.

[1 + 2 = 3 Marks]

```
#!/usr/bin/python

import os, sys



# file descriptors r, w for reading and writing
r, w = os.pipe()

processid = os.fork()
if processid:
   # This is the parent process
   # Closes file descriptor w
   os.close(w)
   r = os.fdopen(r)
   print "Parent reading"
   str = r.read()
   print "text =", str
   sys.exit(0)
else:
   # This is the child process
   os.close(r)
   w = os.fdopen(w, 'w')
   print "Child writing"
   w.write("Text written by child...")
   w.close()
   print "Child closing"
   sys.exit(0)
```

Continued ...

Question 4 [10 Marks]

(a) With an aid of example, explain the differences between the little-endian byte order and the big-endian byte order.

[4 Marks]

(b) Specify the operation of the following inet_ntop( ) function with respect to address conversion.

```
Const char *inet_ntop(int af, const void *src,
                      char *dst, socklen_t size);
```

[3 Marks]

(c) Write a simple TCP server program that continuously waits for the incoming message from the client.

[3 Marks]

Question 5 [10 Marks]

(a) With an aid of diagram, illustrate the steps in a Remote Procedure Call (RPC).

[6 Marks]

(b) Investigate the transport issues for RPC design.

[2 Marks]

(c) Point out **TWO** differences between Local Procedure Call (LPC) and Remote Procedure Call (RPC).

[2 Marks]

End of Paper